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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/736,487

Filing Date: December 15, 2003

Appellant(s): CHIANG ET AL.

MAILED

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Group 3700

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CHIANG ET AL  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 05/29/07 appealing from the Office action  
mailed 01/08/07.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,502,979	Renard	4-1996
6,378,605	Kutcher et al.	4-2002
6,145,327	Navarro	11-2000

3,309,887 D. W. Jacobus

3-1967

## **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

10736487

## ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 6-11, 13-14, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Renard (5,502,979) in view of Kutscher et al. (6,378,605).

Renard discloses a refrigerated display cabinet comprising an insulated (a refrigerated cabinet is inherently insulated) cabinet 50 defining a product display area/shelves 1 maintained in a refrigerated condition at a temperature above 32 degree F (refrigerated

space excluding freezer space is obviously at a temperature above 32 degrees F) and having a compartment 37 separate from the product display area 1 an evaporator 28 disposed in the compartment 37; at least one air circulator 29 disposed within the compartment 37 in cooperative relationship with the evaporator 28; and an air circulation circuit (23- 26) connecting the product display area 1 and in direct air flow communication with the compartment 37. Renard discloses the invention substantially as claimed as stated above. See Fig. 2. However, Renard does not disclose a relatively high airside pressure drop evaporator. The general concept of sizing an evaporator falls within the realm of common knowledge as obvious mechanical expedient and this is illustrated by Kutscher et al., which teach the use of a high airside pressure drop heat exchanger 10 with fin density ranging from 3 fins to 10 fins per inch in a heat exchanging system for the purpose of controlling pressure drop and cooling temperature range. Kutscher et al., also disclose a draw through flow by the action of a fan 12. See Fig. 1, column 12, lines 31- 67. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refrigerated display cabinet of Renard to include the use of a high air side pressure drop heat exchanger with fin density ranging from 3 to 10 fins per inch as taught by Kutscher et al., in order to achieve a refrigeration system with a range of cooling temperatures capable of accommodating various products.

Claims 12, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Renard and Kutscher et al., as applied to claims 6, 9 and 10 above, and further in view of Navarro (6,145,327).

Renard and Kutscher et al. disclose the invention substantially as claimed as stated above. However Renard and Kutscher et al. do not disclose a plurality of fans. Navarro teaches the use of a plurality of fans 16 along an evaporator coil 17 in a refrigerated case for the purpose of running a refrigeration system. See Fig. 7. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refrigerated display cabinet of Renard and Kutscher et al., to include the use of plurality of fans as taught by Navarro to achieve a refrigeration system which would perform at optimal condition with uniform air flow distribution as spacing the fan at about 2 feet apart is an obvious mechanical expedient that one of individual skilled in the art would use in order to achieve uniform flow distribution.

#### **(10) Response to Argument**

The Appellant's arguments filed 05/29/07 have been fully considered but they are not persuasive.

##### **A. Summary of the appellant's arguments**

10-1) On page 4 (last Paragraph) and 5 (first Paragraph) of the Brief, the appellant respectfully submits that Kutscher et al. can not be read to teach or motivate one having ordinary skill in the art to provide a relatively high air side pressure drop evaporator in the environment of a medium temperature refrigerator such as in Renard wherein the evaporator is subject to frost formation on the fins due to the presence of moisture in the air passing from the refrigerated food storage compartment of the refrigerator and through the space between the fins of the evaporator.

10-2) On page 6 of the Brief, the Appellant stipulates that Kutscher et al. does not at all address the issue of, or even recognize the problems attendant to, frost formation and built-up between closely spaced fins. Applicant respectfully submit that Kutscher et al. fail to do so because they did not intend their higher fin density, porous fin heat exchanger to be employed in the environment of a medium temperature refrigerated merchandiser to be wherein frost formation would be a performance issue.

10-3) On page 6 in second Paragraph of the Brief, the Appellant states that there is no teaching, suggestion or motivation in Kutscher et al. that would have led one designing a medium temperature refrigerated merchandiser to go against the conventional practice at the time of the invention and instead select the high fin density embodiment of heat exchanger disclosed by Kutscher et al. to provide a high airside pressure drop evaporator, contrary to conventional practice.

10-4) On page 7 in first Paragraph of the Brief, the appellant argues that it even though Kutscher et al. do disclose a heat exchanger embodiment that has a higher fin density and therefore a higher air-side pressure drop, absent motivation in the cited art to least to try that higher density in a “frost formation” environment, one skilled in the art at the time of the invention would not be lead to make the combination proffered by the Examiner.

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10-5) On page 7 in second Paragraph of the Brief, the appellant states that the cited mentions in Akoi or Kutscher et al. can not be read to teach the use of a high air side pressure drop evaporator in medium temperature refrigerated merchandiser.

10-6) On page 8 in third Paragraph of the Brief, the Appellant argues that, Navarro does not teach, suggest or motivate one skilled in the art to use of a plurality of fans in combination with a relatively high air side pressure drop in a medium temperature refrigerated merchandiser system to provide a more uniform distribution of air flow through the evaporator.

10-7) On page 8 in continuation of the third Paragraph of the Brief, the appellant argues that there is no teaching or disclosure in Navarro, taken alone or in combination with Kutscher et al., that would lead one having ordinary skill in the art to replace the finned evaporator/air circulation fan assembly of Renard with a plurality of fans spaced at about two foot intervals along the length of a high air side pressure drop evaporator.

B. Response to the arguments of the Appellant.

10-1B) In response to the appellant's argument contained in the above sub Para 10-1, the Examiner answer is that the constructional feature of the invention is related with higher fin density evaporator/heat exchanger and higher air-side pressure drop in the heat exchanger. Both the constructional feature of higher fin density and the legitimate teaching of higher air-side pressure drop are provided by Kutcher et al., which teach the

use of a higher fin density ranging from 3 to 10 fins per inch in a heat exchanger and use of high air side pressure drop heat exchanger or the purpose of controlling pressure drop and cooling temperature range (see column 12, lines 31-34). The general concept of sizing an evaporator falls within the realm of common knowledge as obvious mechanical expedient and this is illustrated by Kutscher et al. Moreover, Kutscher et al., also disclose a draw through flow by the action of a fan 12. See Fig. 1, column 12, lines 31- 67. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refrigerated display cabinet of Renard to include the use of a high air side pressure drop heat exchanger with fin density ranging from 3 to 10 fins per inch as taught by Kutscher et al., in order to achieve a refrigeration system with a range of cooling temperatures capable of accommodating various products as stated above in the obviousness rejection. Therefore, appellant's argument that Kutscher et al. do not recognize that a higher fin density heat exchanger will characteristically exhibit a higher air-side pressure drop relative to a lower fin density heat exchanger is weak.

10-2B) In response to the appellant's argument the Examiner answer is that there is no mention of build up of frost formation in the claim language. However, it is well known in the art that a heat exchanger will address the problem of frost formation when it is utilized as an evaporator. The Examiner likes to mention that if a heat exchanger is utilized as an evaporator like the heat exchanger of Kutscher et al., it will address the problem of frost formation. Therefore, if the Kutch's heat exchanger is utilized as an evaporator it will address the problem of the frost formation and build up between the

fins inherently as it meets the constructional feature of higher fin density in the desired range including a teaching of higher air-side pressure drop (A heat exchanger/evaporator having higher air side pressure drop means an increased pressure drop addresses the problem of frost formation and this feature is known in the art long before the invention of the Applicant. For example, see U.S. Patent 3,309,887 of D. W. Jacobus, column 1, lines 35-39). It is also mentioned that a heat exchanger can be used as an evaporator or condenser for an air conditioner(refrigeration) circuit, a radiator or a heater core for a vehicle, or other type heat exchanger. (See column 1, lines 10-12 of US Patent No. 5,214,847 to Akoi). It is also known in the art that in a heat pump refrigeration system an indoor heat exchanger is being used as a condenser in a heating mode of operation when it does not need to address any frost problem whereas, the same heat exchanger is being used as an evaporator in the cooling mode of operation when it does address the problem of frost formation. Therefore, there should be no confusion that a refrigeration heat exchanger can either be used as a condenser or an evaporator. A heat exchanger has a potential ability to address the problem of frost formation and therefore, there is no problem to use Kutcher's et al., heat exchanger as an evaporator to obviously meet the claimed invention. The porous fins of Kutscher et al. do not make any adverse effect, rather they add more surface area and increase overall heat transfer coefficient (see column 1, lines 16-20). Therefore, the argument of the appellant that Kutscher et al. fail to do so because they did not intend their higher fin density, porous fin heat exchanger to be employed in the environment of

a medium temperature refrigerated merchandiser to be wherein frost formation would be a performance issue is weak in light of the argument set forth above.

10-3B) In response to the appellant's argument contained in the above sub Para 10-3, that there is no teaching, suggestion or motivation to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, an ordinary skilled artisan would be motivated to include the teaching of a high air side pressure drop with a high fin density (in the range of the claimed invention) heat exchanger of Kuscher et al. in to Renard in order to achieve among others the benefit of high airside pressure drop evaporator and thus a frost free refrigerator because of the high air side pressure drop. The Examiner recognizes that the designing of a medium temperature refrigerated merchandiser will not go against the conventional practice where there is sufficient motivation to do so as mentioned above. Therefore, the appellant's argument that the high fin density embodiment of heat exchanger disclosed by Kutscher et al. to provide a high airside pressure drop evaporator, contrary to conventional practice is weak.

10-4B) In response to the appellant's argument contained in the above sub Para 10-4, the Examiner answer is that the motivation in the cited art to least to try that higher

density in a “frost formation” environment is available and one skilled in the art at the time of the invention would lead to make the combination proffered by the Examiner because Kutscher et al., motivates that increase in fin density increases pressure drop and increased pressure drop leads to addressing of the frost problem which is known as mentioned above in Para 10-2B. Therefore, as argued by the appellant’s argument that because of the absent motivation in the cited art to least try that higher density in a “frost formation” environment, one skilled in the art at the time of the invention would not be lead to make the combination proffered by the Examiner is weak.

10-5B) In response to the appellant’s argument contained in the above sub Para 10-5, The Examiner recognizes that from Akoi it is known that a heat exchanger can be suitably used at its wide varities of functions or purposes as per requirement. As mentioned above in answer to sub Para 10-1B, a same heat exchanger can be used as an evaporator or a condenser and it is within the common knowledge of an ordinary skill in the art. Therefore, the appellant’s argument that Akoi or kutscher et al. can not be read to teach the use of a high air side pressure drop evaporator in medium temperature refrigerated merchandiser is weak as illustrated above.

10-6B) In response to the appellant’s argument contained in the above sub Para 10-6, The Examiner recognizes that the general concept of sizing, selecting and spacing a fan or blower for a particular heat exchanger application falls within the ream of common knowledge as obvious mechanical expedient and one of ordinary skilled artisan would have been motivated to select the spacing of about 2 foot apart in order to achieve the benefits of providing enough spacing for cooling or Air recirculation of fan motors.

Choosing the size, shape, capacity of a fan or blower and its air distribution in a heat exchanger depends on the amount of air-flow needed. And by fixing the needed airflow through a heat exchanger or evaporator as the case may be, the ultimate goal of cooling effect including the solution of frost problem can be achieved and it is within the knowledge of an ordinary skill in the art. An evaporator can be designed to include a single fan or a dual fan or a multiple fan. In each case the goal is the same to achieve a desired amount of air-flow. As it is well known in the art, one ordinary skilled artisan can choose among a verities of fans in designing an evaporator that to meet the specific air-flow demand. Therefore, the appellant's argument that Navarro does not teach, suggest or motivate one skilled in the art to use of a plurality of fan in combination with relatively high air side pressure drop in a medium temperature refrigerated merchandiser system to provide a more uniform distribution of air flow through the evaporator is weak.

10-7B) In response to the appellant's argument contained in the above sub Para 10-7, the Appellant's argument is not understood as agreed and stated in the response that the plurality of fans of Navarro improve flow distribution which is the ultimate goal of the invention to have a uniform flow distribution. However, the Appellant indicated that the flow distribution of Navarro is done by a flow divider. The Examiner understands that the flow divider does not exclude the use of plurality of fans for creation of a desired airflow. Here, the main improvement in the distribution of air flow is due to the specific spacing of the plural fans. After creation of desired air-flow, the flow divider only helps to further distribution of air flow. There is nothing wrong to have flow divider in combination with the multiple fans. Therefore, the appellant's argument that there is no teaching or

disclosure in Navarro, taken alone or in combination with Kutscher et al., that would lead one having ordinary skill in the art to replace the finned evaporator/air circulation fan of Renard with plurality of fan spaced at about two foot interval along the length of a high air side pressure drop evaporator is weak.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reason, it is believed that the rejections should be sustained.

Respectfully,

Conferees:

(1) Baxter Janet C

  
(2) Jules Frantz F

  
(3) Mohammad M. Ali